

REMARKS

I. STATUS OF THE CLAIMS

Claims 67 – 79 and 105 – 107 are now pending in the present application. Claims 1 – 66, 80 – 83, 103, and 104 have been canceled, while Claims 84 – 102 have been withdrawn. In the Official Action mailed October 10, 2006, pending Claims 67 – 80 and 82 – 83 were rejected. By this amendment, Claims 67 and 79 have been amended and new claims 105 – 107 have been added. No new matter is presented.

II. CLAIM REJECTIONS UNDER 35 U.S.C. §103(a)

A. Rejection of Claims 67 – 68 and 70 – 72

Claims 67 – 68 and 70 – 72 now have been rejected under 35 USC § 103(a) as purportedly being unpatentable over *Kawase, et al.* in view of JP 08132220. The Official Action states that *Kawase, et al.* teaches a process of producing metal castings, including "pouring molten metal into a mold including preheated sleeves and a core aperture...; removing the core using drill and shot blasting after the casting is removed from the mold; and heat treating the casting, wherein the sand core 59 is removed at ambient temperature." The Official Action further notes that *Kawase, et al.* fails to teach the use of a core degrading fluid, but states that JP '220 teaches the use of nozzles for supplying heated fluid (including air or gaseous oxygen) to the core, burning the core and removing the core from the casting. The Official Action concludes that it would have been obvious to one having ordinary skill in the art to try to provide *Kawase, et al.* with the use of a core degrading fluid as taught by JP '220. Applicants respectfully request reconsideration.

Applicants respectfully submit that the cited combination of *Kawase, et al.* and JP '220 is not sufficient to try to render the applicant's claimed invention obvious or unpatentable under 35 USC § 103(a). It is well-settled that to establish a prima facie case of obviousness, (i) there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to those of ordinary skill in the art to modify the references or to combine reference teachings; (ii) there must also be a reasonable expectation of success of such a

combination; and (iii) the prior art reference, as modified, or combination of references must teach or suggest all of the claim limitations. See MPEP § 2142 – 2143. Still further, the teaching or suggestion to make the claimed combination and the reasonable expectation of success of such a combination both must be found in the prior art, and are not to be based on the Applicant's disclosure. In re Vaeck, 947 F 2d 488, 20 USPQ 2d 1438 (Fed. Cir. 1991). In the present Official Action, however, there has been no showing of the required suggestion or motivation to combine the cited references, nor a showing of any expectation of success in making such a combination, necessary to support a prima facie case of obviousness and thus support the rejection of Claims 67 – 68 and 70 – 72 under 35 USC § 103(a).

In making the rejection of Claims 67 – 68 and 70 – 72, the Examiner has specifically noted that *Kawase, et al.* removes the core aperture using drill and shot blasting after the casting is removed from the mold, and further has acknowledged that "the sand core 59 is removed at ambient temperature." The Official Action then goes on to assert that the JP '220 reference teaches the use of nozzles for supplying a heated fluid to effectively burn the core sand and remove the core sand from the casting. Such teachings of these two references thus appear to be in conflict with each other, with the Official Action on one hand recognizing that *Kawase, et al.* removes the sand core at "ambient temperature," and then trying to add to this disclosure a nozzle system that supplies heated air for burning the core, apparently when the core and casting are at a sufficient temperature to cause ignition and combustion of the binder of the sand core (i.e., not at ambient temperature). Thus, not only has there been no suggestion or motivation shown in the references, to try to combine their teachings to try to form the claimed invention when considered as a whole, the teachings of the references appear to diverge or teach away from each other and thus teach away from the attempted combination thereof. Still further, to combine the system of *Kawase, et al.* with the nozzles of the JP '220 seemingly would require an unnecessary modification of *Kawase, et al.*, which already teaches removal of the sand core via drilling and shot blasting, and therefore would require elimination and/or reconstruction of the core removal elements and steps of *Kawase, et al.* to remove and replace its drilling and shot blasting elements and operations with the nozzles of JP '220 to supply heated fluid to burn the core sand for removal of the core from the casting as taught by the JP '220 reference.

Accordingly, it is respectfully submitted that there is no suggestion or motivation found in the references, when taken as a whole, much less any reasonable expectation of success in making such a combination such that Claims 67 – 68 and 70 – 72 are believed to be patentable over the attempted combination of *Kawase, et al.* and the JP '220 reference. Accordingly, it is respectfully requested that the rejection of Claims 67 – 68 and 70 – 72 under 35 USC § 103(a) be withdrawn.

B. Rejection of Claims 69 and 76 – 77

Claims 69 and 76 – 77 have been rejected under 35 USC § 103(a) as being purportedly unpatentable over *Kawase, et al.* in view of JP '220, and in further view of *Legge, et al.* The rejection states that *Kawase, et al.* in view of JP '220 fails to teach the use of partially solidifying the casting in the mold before directing and dislodging the mold with a fluid media, but that *Legge, et al.* teaches the use of partially solidifying the casting in the mold for the purpose of "generating a thin, self-supporting metal shell for further processing without damaging or deforming the casting shape." The Official Action concludes that it would have been obvious to one having ordinary skill in the art to "provide *Kawase, et al.* in view of JP '220 the use of partially solidifying the casting in the mold as taught by *Legge, et al.* in order to form a thin, self-supporting metal shell before directing and dislodging the mold with fluid. Applicants respectfully request reconsideration.

As previously discussed with respect to Claims 67 – 68 and 70 – 72, there has been no showing in the Official Action of any suggestion or motivation in the art to try to combine the cited references of *Kawase, et al.* in view of JP '220, much less further modifying this combination with the teachings of *Legge, et al.* to try to form the claimed invention. To support his conclusion of obviousness, "either the references must expressly or impliedly suggest the claimed combination or the Examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references." Ex Parte Clapp, 227 USPQ 972, 973 (Bd. Pat. App. & Int. 1985). With respect to the present rejections, such a showing of a motivation of suggestion in the references, or a convincing line of argument supporting such a claimed combination has not been made. The Examiner's contention that "it would have been obvious...to provide *Kawase, et al.* in view of JP

'220, the use of partially solidifying the casting in the mold as taught by *Legge, et al.* in order to form a thin, self-supporting metal shell before directing and dislodging the mold with fluid," is at best a recognition (apparently based upon Applicants' disclosure) of a need not found or addressed in the cited references of *Kawase, et al.* and JP '220, either alone or in combination. However, "[R]ecognition of a need does not render obvious the achievement that meets that need...recognition of an unsolved problem does not render the solution obvious." Cardiac Pace Makers, Inc. v. St. Jude Medical, Inc. 72 USPQ 3d, 1333 (Fed. Cir. 2004).

Applicants further respectfully point out that the Examiner cited *Legge, et al.* for disclosing partially solidifying a casting within the mold, which apparently becomes necessary to address a need or problem with the combination of the fluid nozzles and the supplying/direction of heated fluid into the core aperture as taught by JP '220 with the system of *Kawase, et al.* (i.e., a need to solidify the casting before hitting it with the fluid). Thus, rather than providing a clear suggestion or motivation to combine the teachings of these references to try to form the claimed invention, it appears that the combination of the *Kawase, et al.* and JP '220 references actually create a problem that the teachings of an additional reference (*Legge, et al.*) are then required by the Official Action to try to solve. Such a piecemeal approach of picking and choosing various teachings of the cited references and trying to combine them to form the claimed invention is not, however, permissible and smacks of a hindsight reconstruction based upon applicant's disclosure. According to the MPEP § 2141:

To reach a proper determination under 35 USC § 103, the Examiner must step backward in time and into the shoes worn by the hypothetical "person of ordinary skill in the art" when the invention was unknown and just before it was made. In view of all factual information, the Examiner must then make a determination whether the claimed invention "as a whole" would have been obvious at that time to that person. Knowledge of applicant's disclosure must be put aside in reaching this determination, yet kept in mind in order to determine the "differences," conduct the search and evaluate the "subject matter as a whole" of the invention. The tendency to resort to "hindsight" based upon Applicants' disclosure is often difficult to avoid due to the very nature of the examination process. However, impermissible hindsight must be avoided and a legal conclusion must be reached based on the facts gleaned from the prior art.

Respectfully, it appears that the Examiner has failed to "step backward in time" to when the Applicants' invention was unknown, but rather has proposed modifications and combinations

of the various cited references for which there is no suggestion, no motivation, and no incentive to make, and which combination seems to be based upon knowledge of Applicants' very invention in order to meet and solve the problems addressed by the claimed invention.

Accordingly it is respectfully submitted that claims 69 and 76 – 77 are patentable over the purported combination of *Kawase, et al.* in view of JP '220, and in further view of *Legge, et al.* Thus, it is respectfully submitted that the rejection of these claims under 35 USC § 103(a) should be withdrawn.

C. Rejection of Claims 73, 75, 80 and 82 – 83

Claims 73, 75, 80 and 82 – 83 now have been rejected under 35 USC § 103(a) as purportedly being unpatentable over *Kawase, et al.* in view of JP '220, and in further view of *Edamura, et al.* and in further view of JP 63016853 (the "JP '853"). The Official Action states that *Kawase, et al.* fails to teach the use of a process control temperature for the casting associated with the casting, heat treating and core opening processes, but that *Edamura, et al.* teaches the use of a process control temperature for the castings associated with both casting and heat treating, while JP '853 teaches the use of removing a sand core near apertures by using air and grit, such as by urging elements (blasting guns) "while the casting is at a process control temperature (high temperature) right after casting for the purpose of shorting the core removing period and improving casting productivity." The Official Action then concludes that it would have been obvious to one having ordinary skill in the art to provide *Kawase, et al.* with the use of a process control temperature for the castings associated with both the casting, heat treating and core opening processes as taught by *Edamura, et al.* and JP '853 to try to control the microstructure mechanical properties of a cast cylinder block. Applicants respectfully request reconsideration.

Again, Applicants respectfully point out that there has been no showing of any suggestion or motivation to try to combine the cited references. Indeed, the JP '220 reference, although cited as purportedly being part of the combination in the first paragraph of this rejection, does not appear to be discussed or applied as part of this rejection. In addition, the conclusion stated by the Official Action for trying to combine the cited references to reject Claims 73, 75, 80 and 82 – 83 again appears to be trying to support the combination of the teachings of such references

based upon a recognition of needs and/or shortcomings of each of these references in trying to form the claimed invention, using the Applicants' invention as a template. Each of the cited references are directed to very specific systems, or, as in the case of *Edamura, et al.* to a specific formulation for coating a casting, and therefore disclose different methods of manufacture and production of such castings. For example, *Kawase, et al.* is specifically directed to the manufacture of Siamese cylinder blocks using highly rigid metal sleeves places into a Siamese type cylinder barrel molding cavity. Afterwards, molten aluminum is poured into the mold under pressure so that the sleeves are cast in the mold as the aluminum cylinder block is solidified. As apparently recognized by the Official Action, there is, however, apparently no mention of maintaining the temperature of the metal and the casting at or above a process control temperature while allowing the metal of the casting to at least partially solidify and thereafter at least partially heat treating the casting within the mold. Such steps likewise are not taught or suggested by the other cited references of *Edamura, et al.* or the JP '853 and/or JP '220 references, such that these references fail to cure the deficiencies of *Kawase, et al.* in trying to form the claimed invention.

As noted above, *Edamura, et al.* is directed to providing an engine cylinder block made from an aluminum alloy, having specifically described weight percentages of aluminum and other materials, such as silicon, copper, and magnesium to provide very specific properties for the cylinder block. *Edamura, et al.* does not appear to mention or recognize a process control temperature for the casting metal, nor the step of controlling the cooling of the metal of the casting to maintain it at a temperature at or above its process control temperature, to at least partially solidify the casting and thereafter at least partially heat treats the casting while still within its mold. The casting methods disclosed by *Edamura, et al.* further do not appear to disclose any steps in addition to those already disclosed by *Kawase, et al.* so as to warrant the combination of *Edamura, et al.* and *Kawase, et al.* Likewise, the JP 853 reference, as best understood, seems to teach removing the sand core by using air or grit, which is very similar to the core removal operation of drilling and shot blasting already taught by *Kawase, et al.* such that trying to combine the teachings of *Edamura, et al.* and the JP '853 reference with *Kawase, et al.*,

as purportedly modified by the JP '220 reference, would seem to be redundant and therefore unnecessary.

Accordingly, it is respectfully submitted that there is no suggestion or motivation to try to combine the cited references, nor has there been any showing of a reasonable expectation of success at making such a combination. Indeed, the use of such an extensive number of references seems to indicate more of a piecemeal approach to trying to render an invention disclosed by Claim 73, 75, 80 and 82 – 83 obvious. Such choosing among bits and pieces of the several cited references to try to make the cited combination to try to meet or solve the problems addressed by the claimed invention appears to be defining the problem in terms of its solution, which "reveals improper hindsight in the selection of the prior art relevant to obviousness." Monarch Knitting Machinery Corp. v. Sulzer Morat GmbH, 139 F 3d 837 (Fed Cir. 1998). Accordingly, it is respectfully submitted that Claims 73, 75, 80 and 82 – 83 are patentable over the cited combination of references under 35 USC § 103(a) and therefore it is respectfully requested that this rejection of Claims 73, 75, 80 and 82 – 83 be withdrawn.

D. Rejection of Claims 78 – 79

Claims 78 – 79 have been rejected under 35 USC § 103(a) as purportedly being unpatentable over *Kawase, et al.* in view of JP '220 and in further view of *Legge, et al.*, *Edamura, et al.*, and JP '853. Applicants note that Claims 78 – 79 are dependent from Claim 76, either directly or indirectly, and thus are believed to be allowable over the cited art of record for at least the reasons discussed above with respect to Claim 76. Accordingly, it is respectfully submitted that this rejection of Claims 78 – 79 likewise should be withdrawn.

E. Rejection of Claim 74

Claim 74 has now been rejected under 35 USC § 103(a) as purportedly being unpatentable over *Kawase, et al.* in view of JP '220 and in further view of *Crafton, et al.* (U.S. Pat. No. 5,565,046). Claim 74 is dependent from Claim 67, which is believed to be patentable as discussed above. Claim 74 therefore likewise is believed to be patentable over the cited combination of references for at least the reasons discussed above with respect to claim 67; and it accordingly is respectfully requested that the rejection of claims 74 under 35 USC § 103(a) be withdrawn.

F. New Claims 105 – 107

New Claims 105 – 107 have now been added. These claims are directed to a method of processing a metal casting comprising providing a mold; pouring a molten metal into the mold; allowing the metal to at least partially solidify to form the casting within the mold and at least partially heat treating the casting of the mold; and substantially at all times from the pouring until the at least partially heat treating of the casting, maintaining the metal and the casting at or above the process control temperature for the metal of the casting. The process control temperature generally is a temperature below which, for every one minute of time the temperature of the casting decreases, more than one minute of heat treatment time thereafter will be required to obtain the desired properties of the casting. Such a method of processing a metal casting is not believed to be taught or suggested by the cited art of record. It is accordingly respectfully submitted that new claims 105 – 107 are allowable over the cited art of record.

CONCLUSION

In view of the foregoing remarks, Applicant respectfully asserts that the various rejections of the claims as set forth in the non-final Office Action of October 10, 2006 have been addressed and overcome. Applicant further respectfully asserts that all claims are in condition for allowance and requests that a Notice of Allowance be issued. If any issues remain that may be resolved through Examiner's Amendment, or clarified in any manner, a call to the undersigned attorney is courteously solicited.

The Commissioner is hereby authorized to charge any fees due, or credit any overpayment, to Deposit Account No. **09-0528**.

Respectfully submitted,



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